Hanna Stope Water Quality Sample Results

PREPARED FOR: Mary Kay Voytilla/USEPA

PREPARED BY: Nahide Gulensoy/CH2M HILL
Jim Stefanoff/CH2M HILL

COPIES: Jay Dehner/CH2M HILL
Bill Hudson/CH2M HILL
John Riley/Pyrite Hydrochem
Nick Zilka/IDEQ
Mike Thomas/IDEQ
Mike Mahoney/USACE
Dale Ralston/University of Idaho
Bob Hopper/New Bunker Hill Mining Co.
Matt Germon/CH2M HILL
Travis Pyle/CH2M HILL
David Bunte/CH2M HILL

DATE: October 4, 1999

A reconnaissance trip was conducted on July 6, 1999 into the Bunker Hill Mine in Kellogg, Idaho. The purpose was to gain a better understanding of the underground conditions, configuration, and characteristics of the Hanna Stope and the associated access adits and shafts to establish a better assessment of feasabililty and cost for its use as an underground depository of waste sludge. The findings of this reconnaissance are documented in *Field Reconnaissance of Hanna Stope* (CH2M HILL, 1999).

As part of the work effort, four water quality samples were collected from various levels of the mine during the reconnaissance trip on July 6, 1999. Table 1 summarizes the sample identification, location, collection time, estimated flow, and field measurements (pH and conductivity). Figures 1 and 2 show these sample locations on 2 Level and 6 Level, respectively. These figures were originally prepared for *Field Reconnaissance of Hanna Stope* (CH2M HILL, 1999).

TABLE 1
Summary Table for Hanna Stope Water Quality Samples

Sample ID	Sample Location	Time	Estimated Flow / Volume	pH	Conductivity (µmhos/cm)
6PD	Taken from pond before main draw points; 6 Level	14:27	200 gal	3.8	380
6HS	Drainage from stope; 6 Level	14:50	5-6 gpm	5.3	1,600
6DP	Last draw point on left before end of drift; 6 Level	14:58	10 gpm	3.8	1,300
2SU	Sullivan No. 2 water going down raise; 2 Level	16:43	10 gpm	4.6	150

These four water quality samples were analyzed for total metals (EPA TAL), total suspended solids (TSS), sulfate, and lime demand/solids formed. The analytical results are summarized in Table 2.

TABLE 2
Analytical Results for Hanna Stope Water Quality Samples

	6PD	6HS	6DP	2SU
Total Metals (µg/L)				
Ag – Silver	8.6	20.8	8.9	2.1
Al – Aluminum	70.5	127	69.9	459
As – Arsenic	3.0	3.0	3.0	3.0
Ba – Barium	10.0	1.7	7.0	28.1
Be – Beryllium	0.4	0.4	0.4	0.4
Ca – Calcium	24,500	47,100	43,200	2,430
Cd – Cadmium	22.2	106	88.0	6.0
Co – Cobalt	19.3	50.9	29.7	5.5
Cr – Chromium	1.9	1.5	1.6	1.7
Cu - Copper	2.5	3.5	4.8	3.3
Fe – Iron	7,940	662	5,150	8,810
Hg- Mercury	0.1	0.1	0.1	0.1
K – Potassium	2,010	1,870	1,520	830
Mg – Magnesium	58,300	187,000	145,000	3,910
Mn – Manganese	69,900	178,000	74,300	6,000
Na – Sodium	1,590	1,280	962	927
Ni – Nickel	44.9	77.9	47.3	5.6
Pb – Lead	449	1,290	644	781
Sb – Antimony	3.0	3.0	3.0	3.0
Se – Selenium	5.8	24.9	5.1	2.3
Tl – Thallium	11.3	53.7	13.2	3.3
V – Vanadium	1.4	1.4	1.4	1.4
Zn – Zinc	13,000	48,800	42,200	1,500
Sulfate (mg/L)	514	1,510	997	65.1
TSS (mg/L)	< 10.0	< 10.0	17.0	11.0
Lime Demand (lbs/1,000 gal)	1.67	4.67	2.34	0.33
Solids Formed (lbs/1,000 gal)	1.86	5.95	2.66	0.17

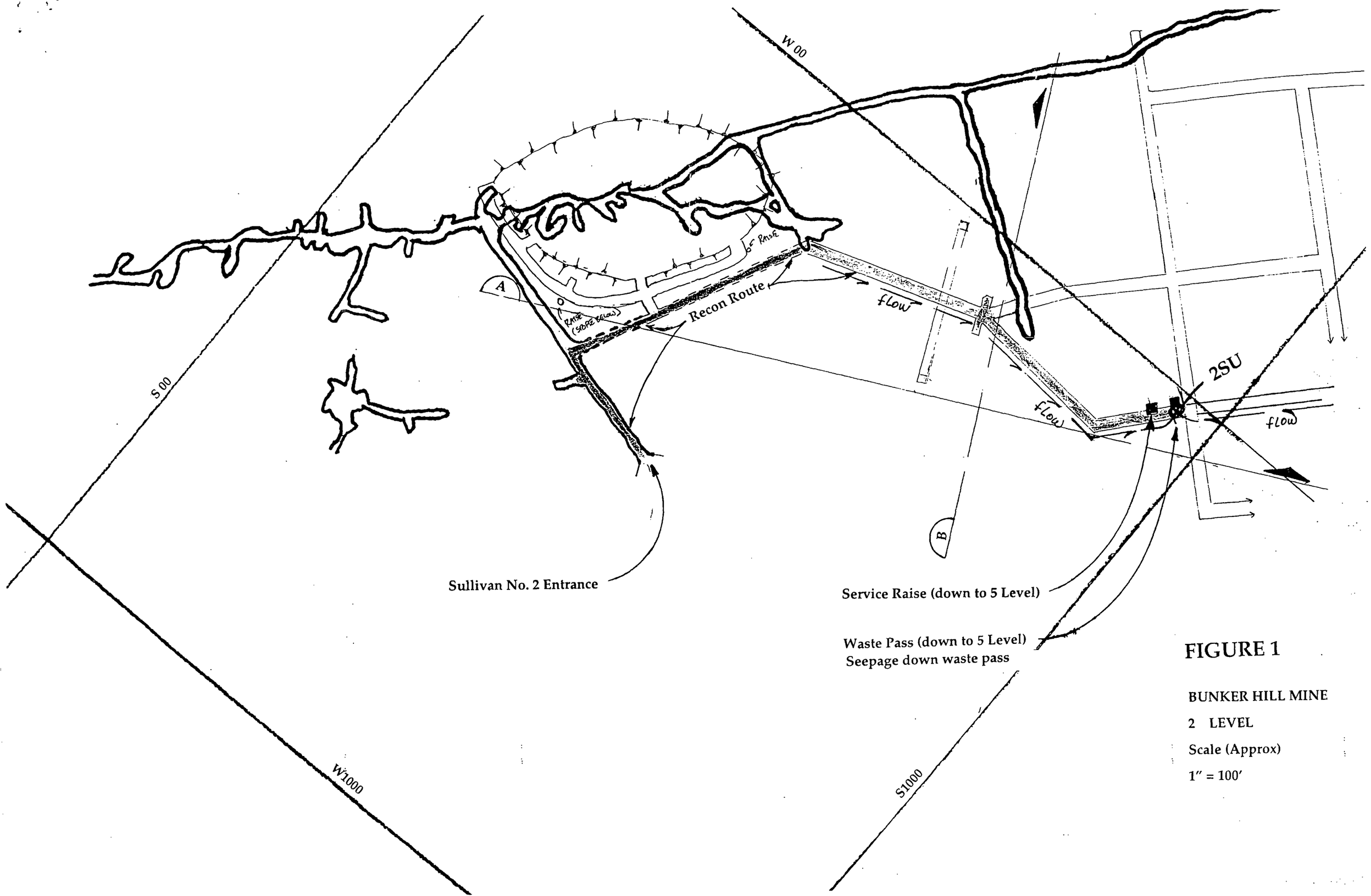

FIGURE 1

BUNKER HILL MINE

2 LEVEL

Scale (Approx)

1″ = 100′

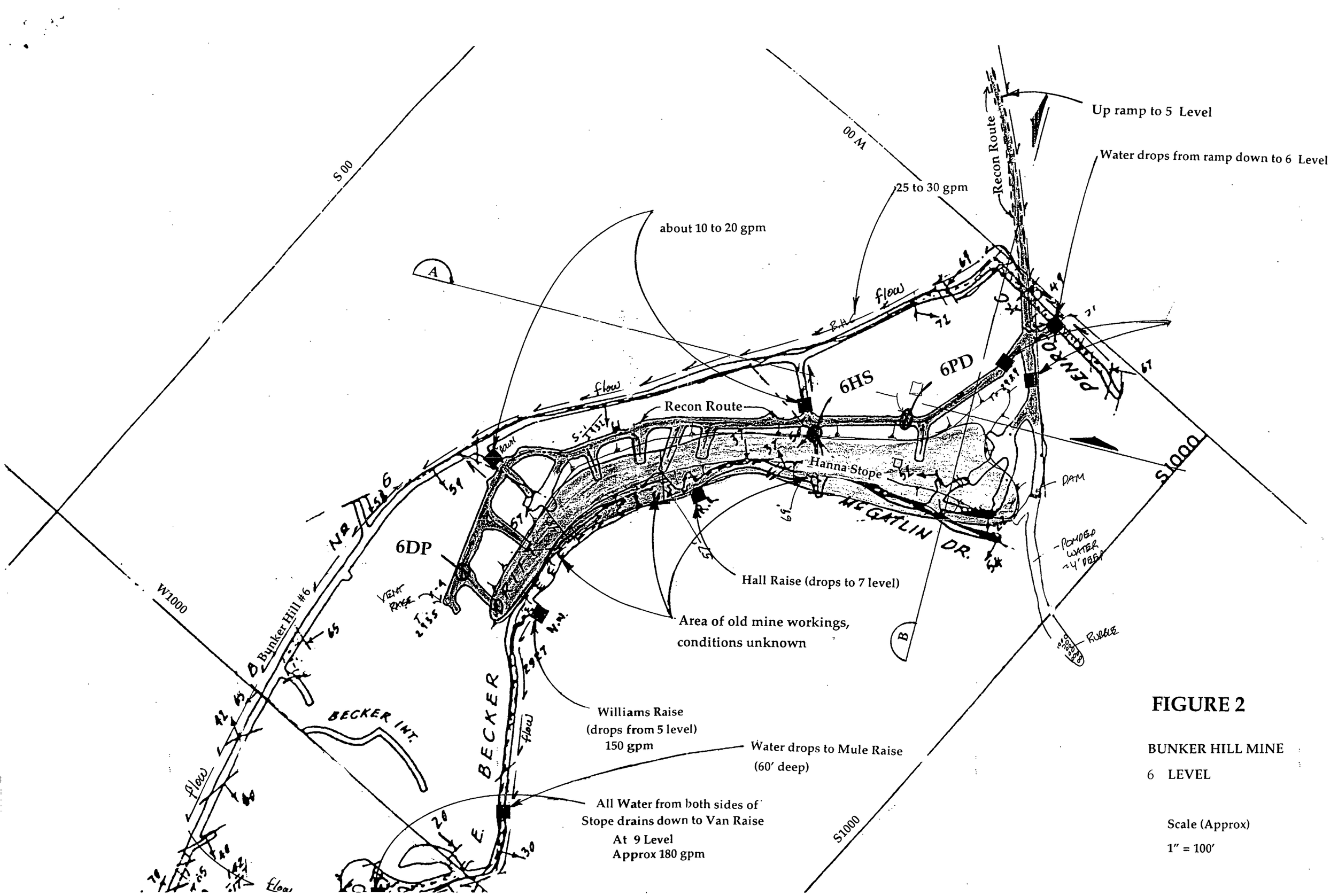

FIGURE 2

BUNKER HILL MINE

6 LEVEL

Scale (Approx)

1″ = 100′

CH2MHILL TRANSMITTAL

To: USEPA
1200 Sixth Ave., ECL-113
Seattle, WA 98101

From: Jim Stefanoff/CH2M HILL
9 South Washington, Suite 400
Spokane, WA 99201-3709

Attn: Mary Kay Voytilla

Date: October 15, 1999

Re: Bunker Hill – Hanna Stope Field Recon Water Quality Sample Results

We Are Sending You:

☑	Attached		Under separate cover via	
	Shop Drawings	☑	Documents	Tracings
	Prints		Specifications	Catalogs
	Copy of letter		Other:	

Quantity	Description
1	Hanna Stope Water Quality Sample Results Tech Memo

If material received is not as listed, please notify us at once

Copy To:

Jay Dehner/CH2M HILL
Bill Hudson/CH2M HILL
John Riley/Pyrite Hydrochem
Nick Zilka/IDEQ
Mike Thomas/IDEQ
Mike Mahoney/USACE
Dale Ralston/University of Idaho
Bob Hopper/Bunker Hill Mining Co.
Matt Germon/CH2M HILL
Travis Pyle/CH2M HILL
David Bunte/CH2M HILL